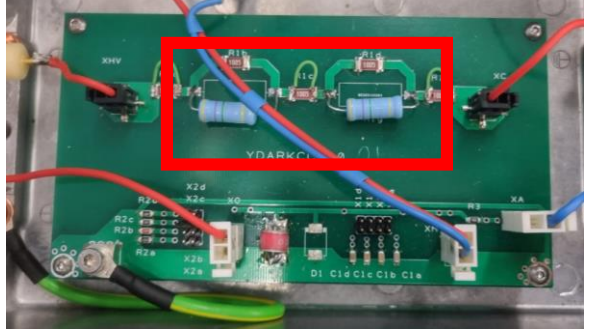
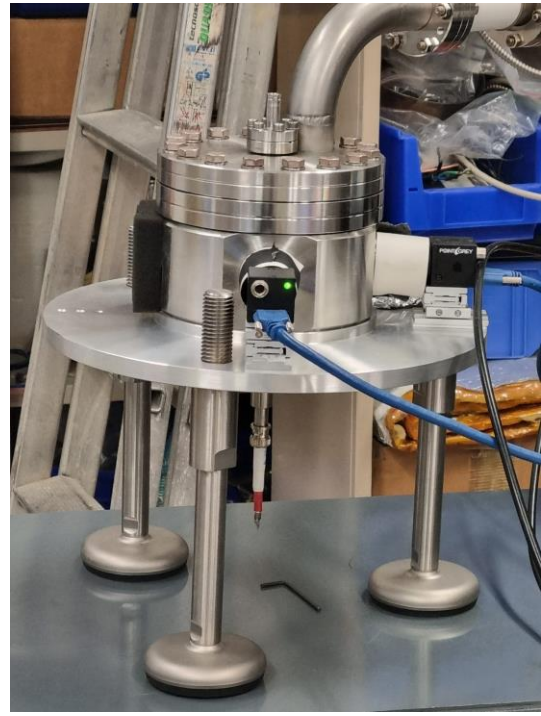
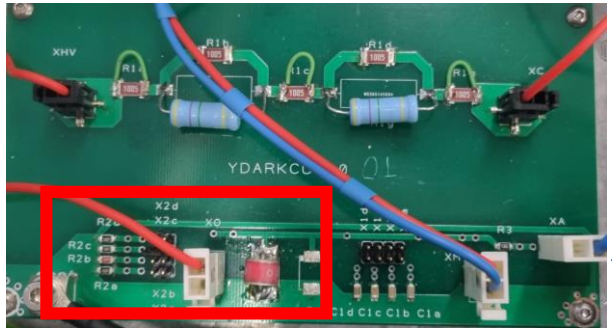
Field Emission Measurement



R_{load}



V

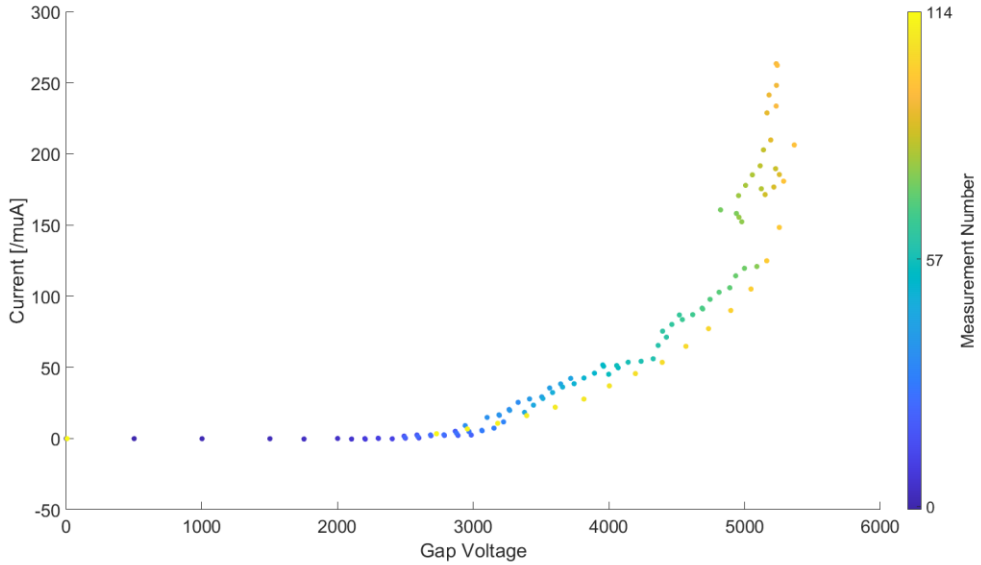


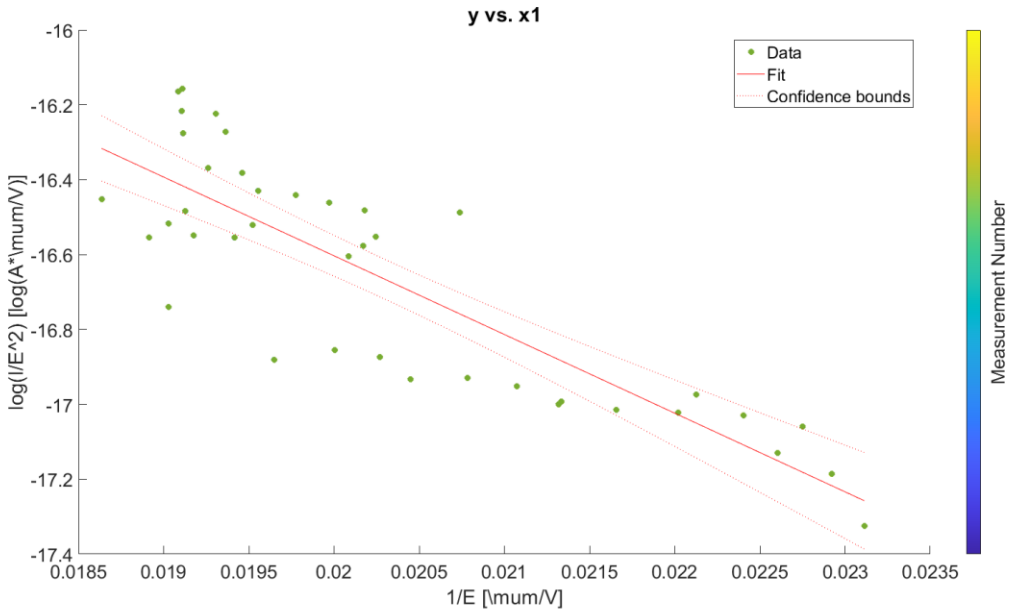
M

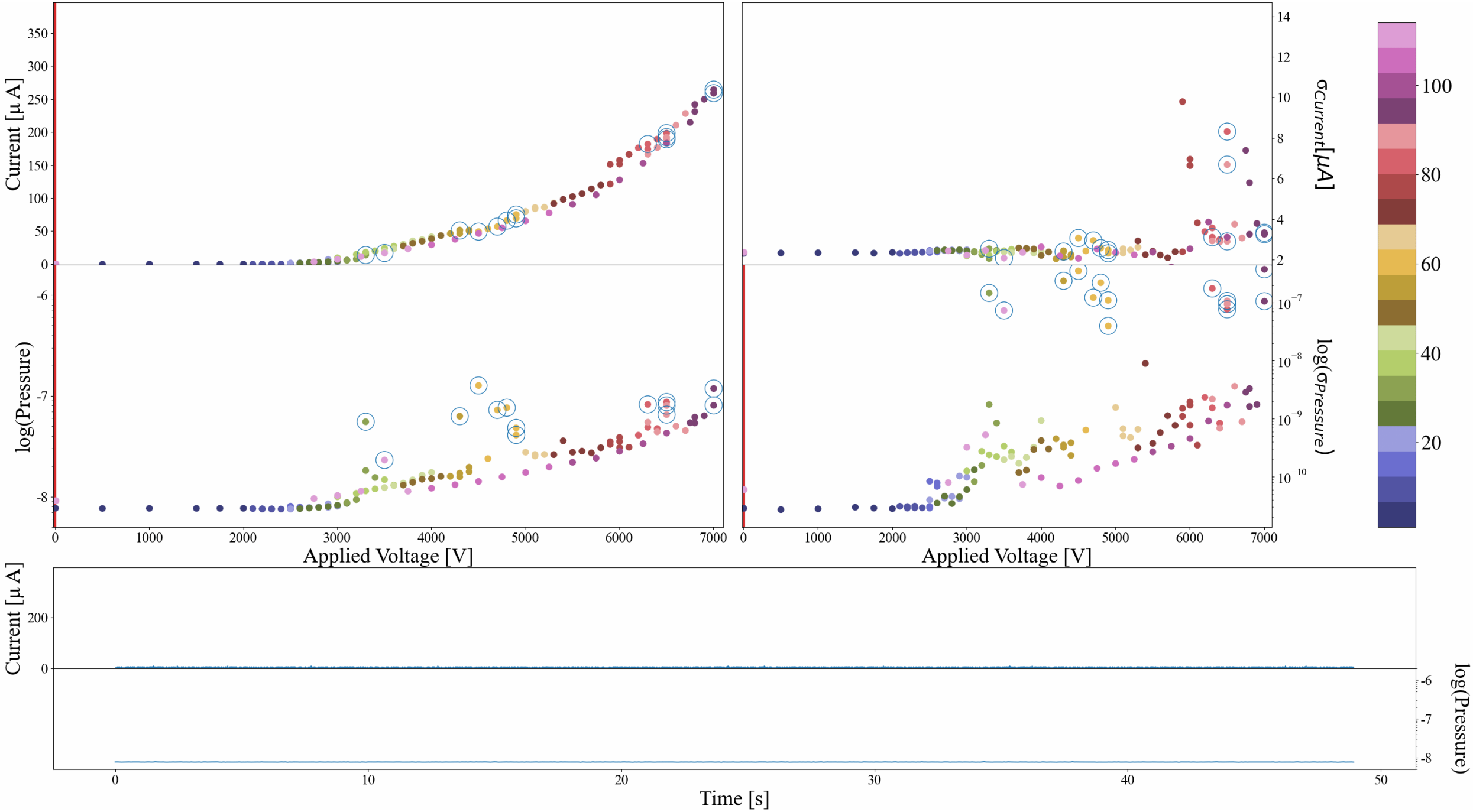
R_1

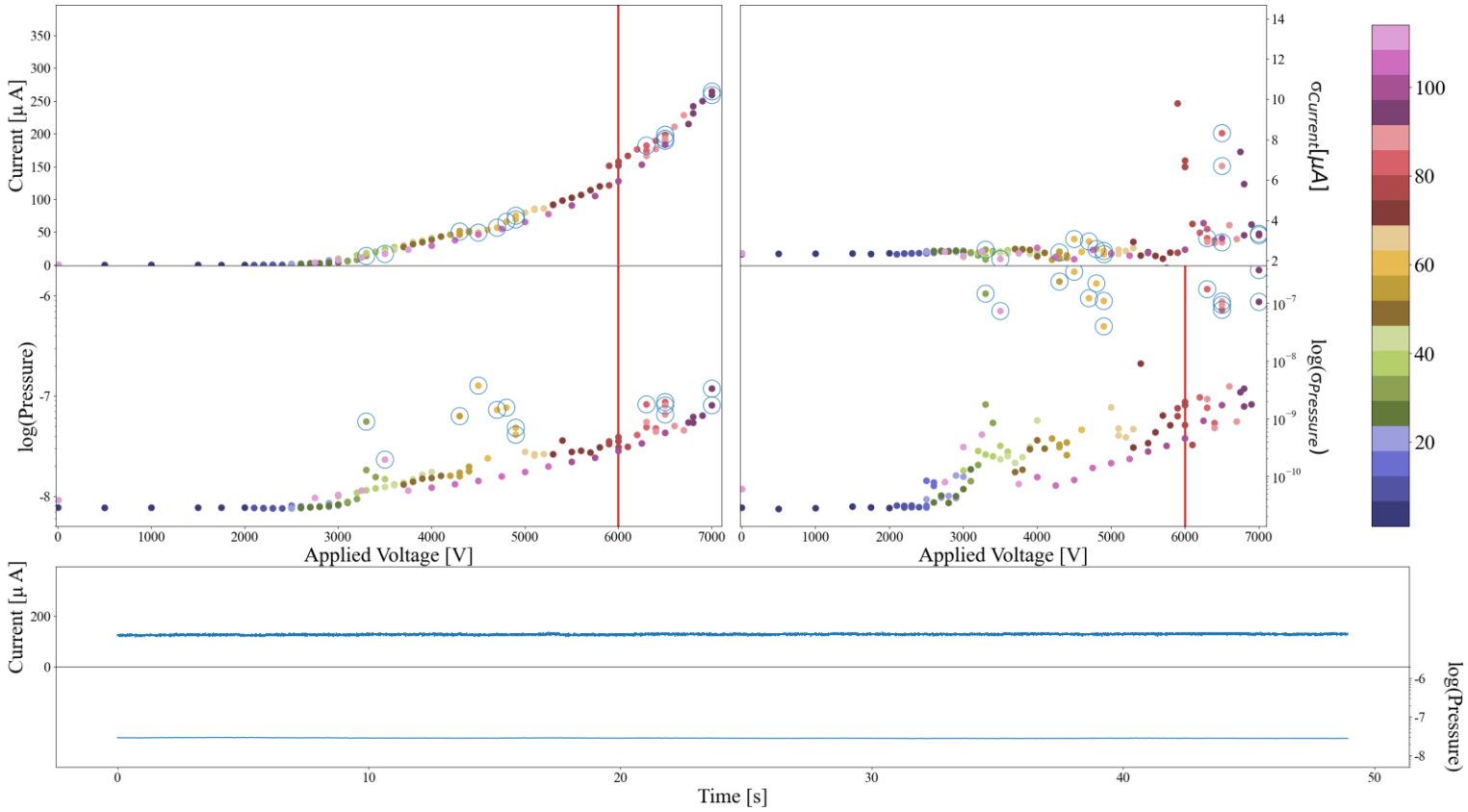
O

Getting field enhancement out






Current [μA]
log(Pressure)
Applied Voltage [V]
σCurrent[μA]
log(σPressure)
Applied Voltage [V]
Current [μA]
log(Pressure)
Time [s]



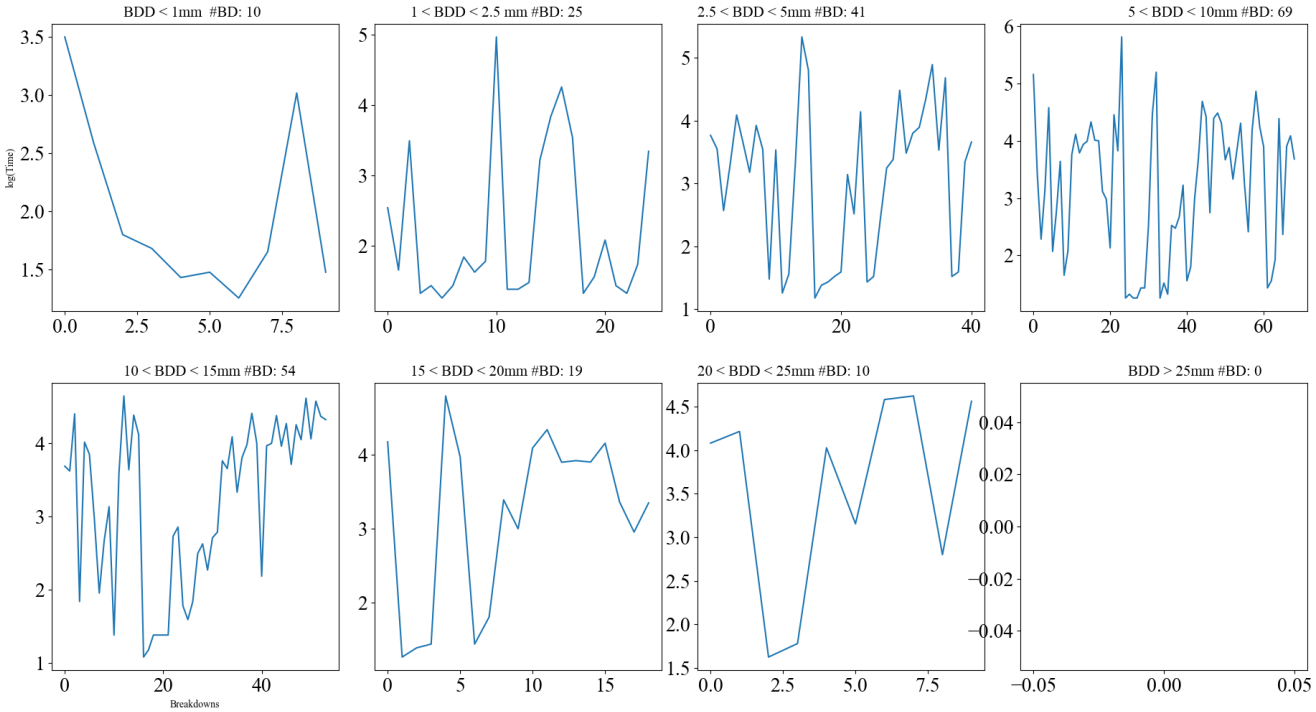
Each dot in the dataset represents a measurement. A breakdown in that run is represented with a blue circle. The red line indicates which measurement we are on and the applied voltage. In addition, the pressure and current are shown in real time underneath, as each measurement lasts 50seconds.

Every time there was a breakdown, the pressure had a spike in it's fluctuations, as expected. However, that is not the case for current

Additional slides!

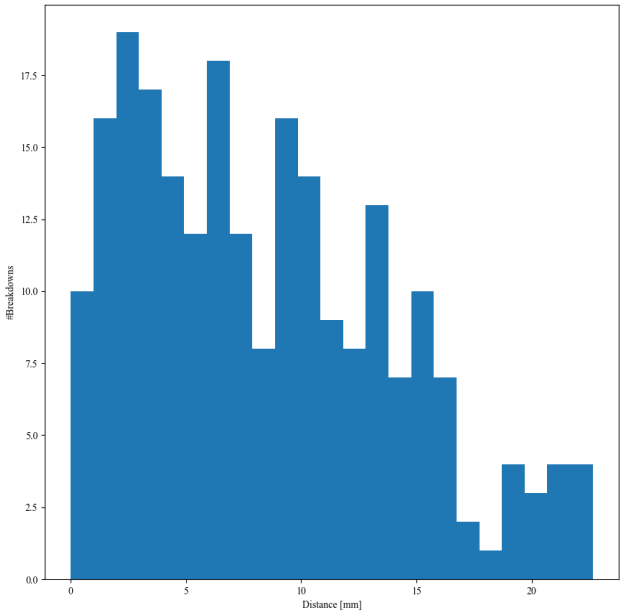
- So I’ve been testing a little out with the breakdown data.
  The following datasets are from mine (61 CuBe) electrode and Catharinas (62 RFQ Irrad).
  Note that Catharinas electrode have had a lot more breakdowns than mine as well as clusters.

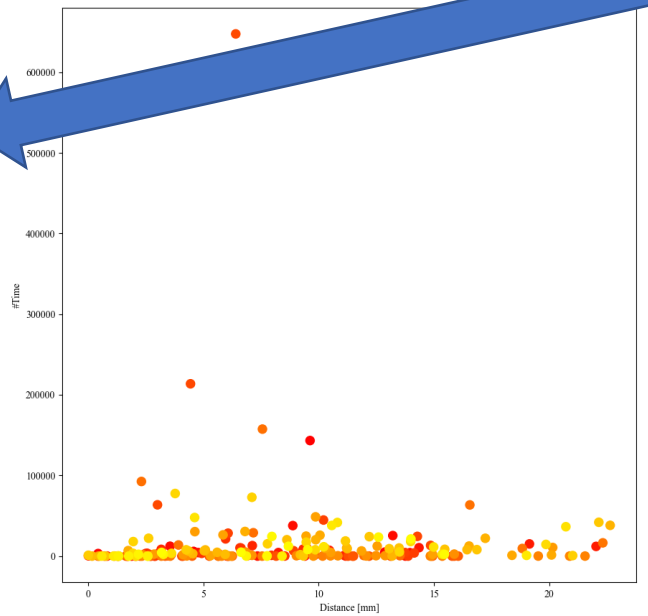
- But maybe these tests also indicates what is a good/bad material.



Here, I take the breakdowns that have less than 1mm distance (upper left) and plot the time difference they had (y in log). Second plot have the breakdowns between 1 and 2.5mm etc. (indicated above the plots).

Histogram that is divided in mm. So you have 10 breakdowns that have 0-1mm distance between them, 16 with 1-2mm distancet etc.

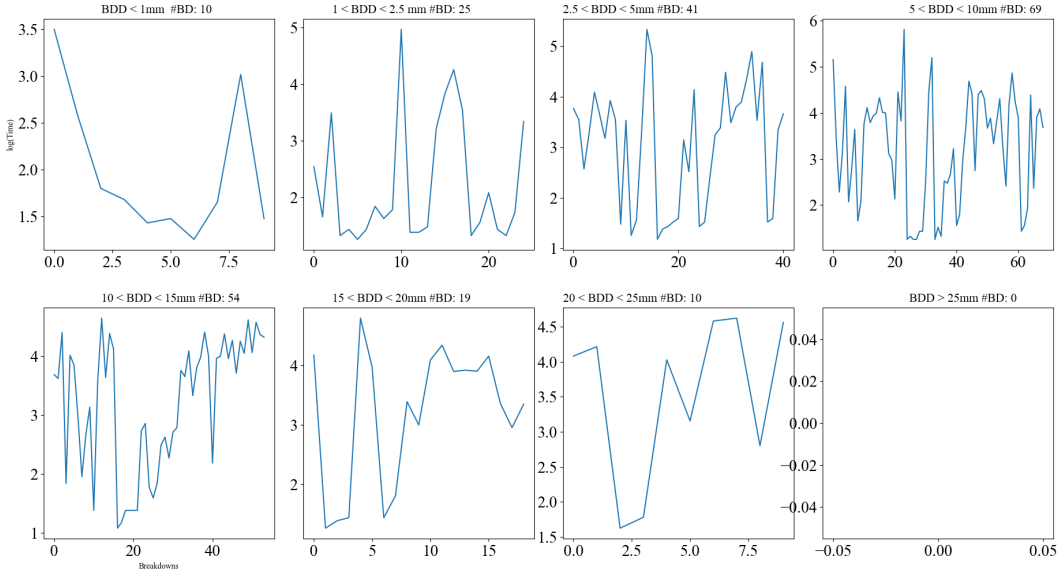


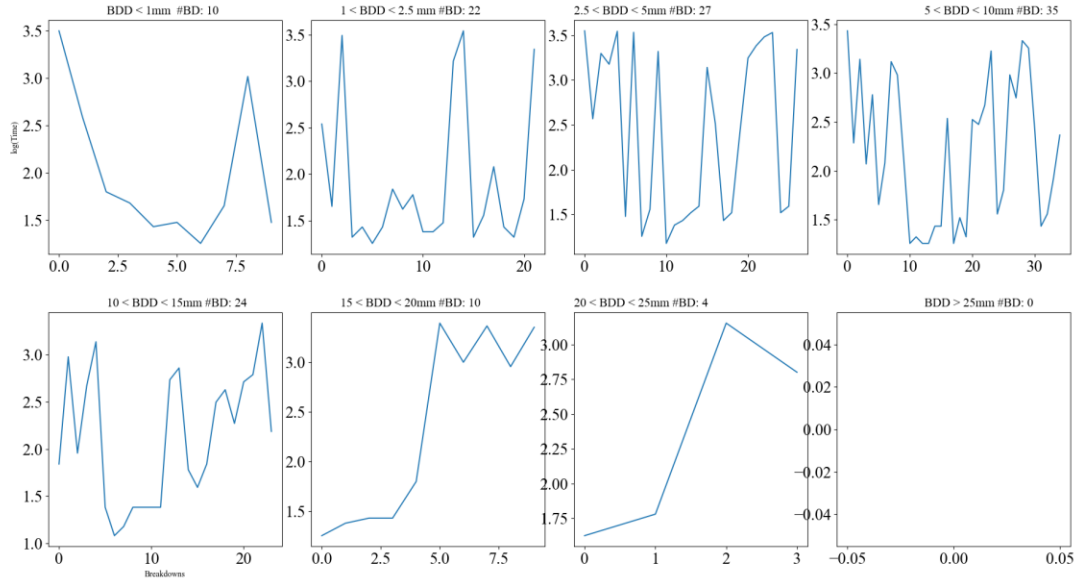


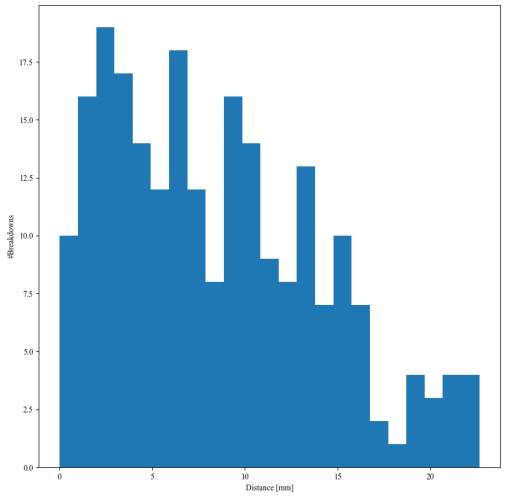
Scatter plot betwen breakdown distance and time.

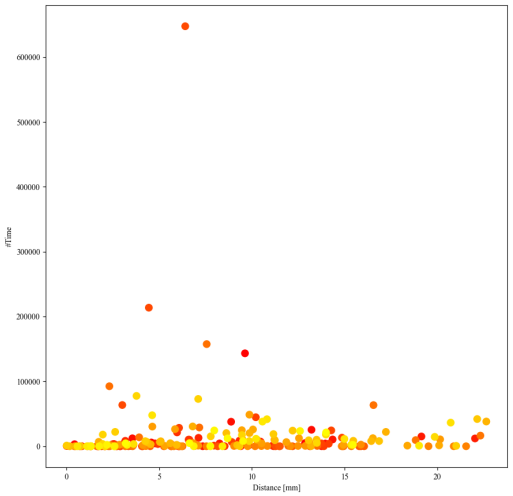
CuBe

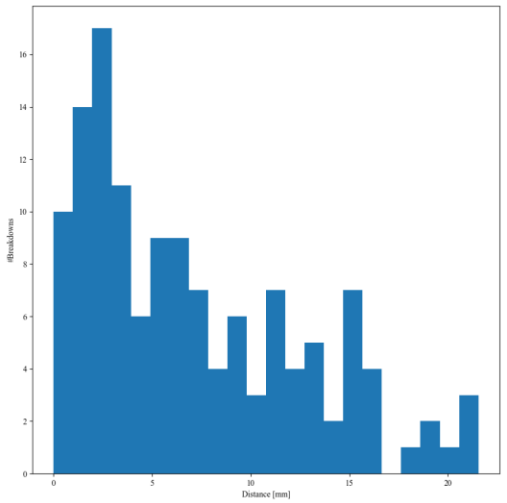
In this, I filtered out all breakdowns that occurred over 1 hour apart. So in all of these the time between the breakdowns are always <1hour

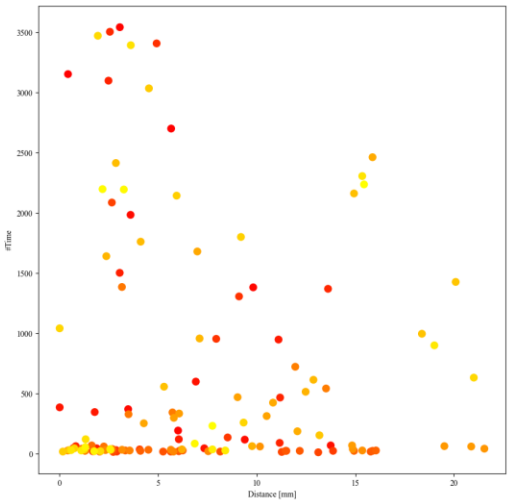




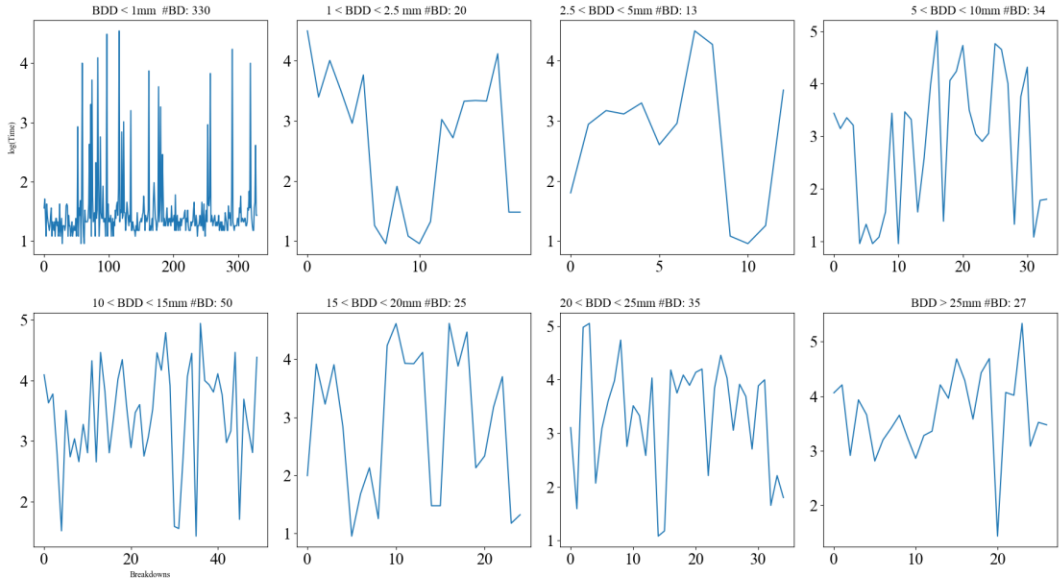


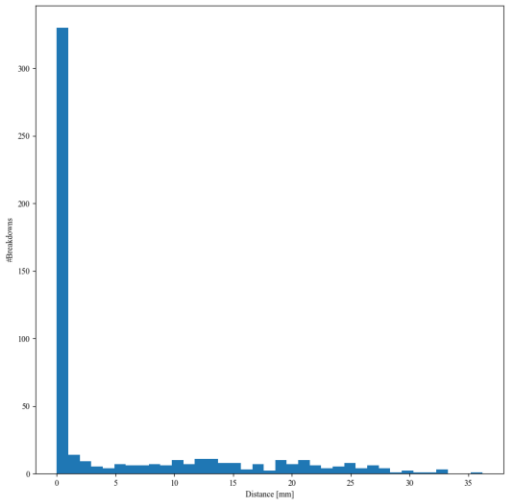


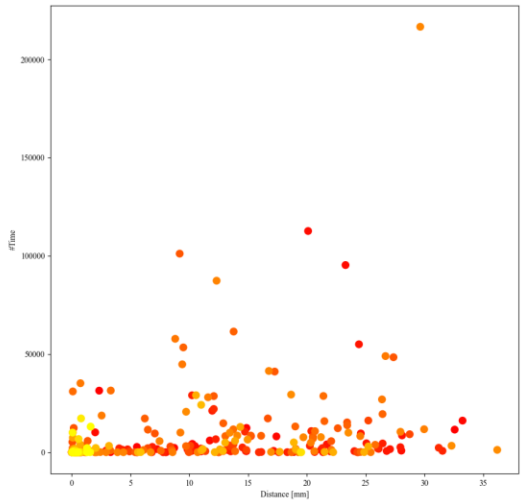




RFQ Irrad







Also time filtered